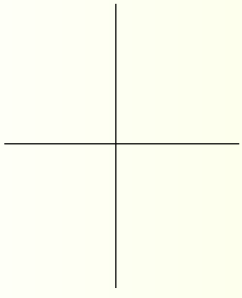
## Alg. 2 Warm Up #9-4

1. Convert: degrees <---> radians

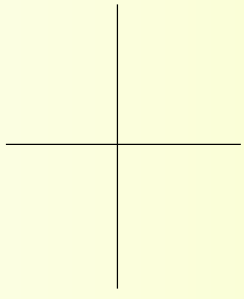
a) $\frac{11\pi}{12}$ b) $72^{o}$ c) $140^{o}$

2. Draw the angle in standard position and state the reference angle.

a) $\frac{7\pi}{9}$



b) $\frac{5\pi}{4}$



## HW Questions: pink WS

1. $x = 7$
2. $x = -3, -4$
3. $x = \frac{1}{4}$
4. $x = 2$
5. $x = 11, -1$
6. $x = -3 \pm 3\sqrt{5}$
7. $x = 1 \pm 2\sqrt{7}$
8. $x = 4, -1$
9. $x = -\frac{2}{3}, 1$
10. $x = -2, -4$
11. $x = \frac{1}{5}, -\frac{1}{2}$
12. $x = \frac{3}{4}, 5$
13. $x = \frac{1}{6}, 5$
14. $x = -\frac{4}{3}, \frac{3}{2}$

3. $\left(\sqrt{x}+2\right)^2=\left(\sqrt{x+6}\right)^2$

$x+4\sqrt{x}+4=x+6$

$\frac{4\sqrt{x}}{4}=\frac{2}{4}$

$\left(\sqrt{x}\right)^2=\left(\frac{2}{4}\right)^2$

$x=\frac{1}{4}$

$(a+b)^2$

$a^2+2ab+b^2$

4) $\sqrt{3x+3}-\sqrt{2x}=1$

$\left(\sqrt{3x+3}\right)^2=\left(1+\sqrt{2x}\right)^2$

$3x+3=1+2\sqrt{2x}+2x$

$\left(\frac{x+2}{2}\right)^2=\left(\frac{2\sqrt{2x}}{2}\right)^2$

$4\cdot\frac{x^2+4x+4}{4}=(2x)4$

$x^2+4x+4=8x$

$x^2-4x+4=0$

$(x-2)^2=0$

$x=2$

6) $2x^2+12x=72$

$2(x^2+6x+9)=72+18$

$\frac{2(x+3)^2}{2}=\frac{90}{2}$

$\sqrt{(x+3)^2}=\sqrt{45}$

$x+3=\pm\sqrt{9}\sqrt{5}$

$x=-3\pm3\sqrt{5}$

7) $3x^2 - 6x = 81$

$3(x^2 - 2x + 1) = 81 + 3$

$\frac{3(x-1)^2}{3} = \frac{84}{3}$

$(x-1)^2 = 28$

$x - 1 = \pm\sqrt{4}\sqrt{7}$

$x = 1 \pm 2\sqrt{7}$

$$\begin{array}{r} 28 \\ 3\overline{)84} \\ -6\downarrow \\ \hline 24 \\ -24 \\ \hline 0 \end{array}$$

8) $x^2 - 3x - 4 = 0$

$x^2 - 3x + \frac{9}{4} = \frac{4}{4}\cdot\frac{4}{1} + \frac{9}{4}$

$\sqrt{\left(x - \frac{3}{2}\right)^2} = \sqrt{\frac{25}{4}}$

$x - \frac{3}{2} = \pm\frac{5}{2}$

$+\frac{3}{2} \qquad +\frac{3}{2}$

$x = \frac{8}{2}, -\frac{2}{2}$

$\boxed{x = 4, -1}$

14) $6x^2 - x - 12 = 0$

~~$(6x \quad)(x \quad)$~~

$(3x + 4)(2x - 3) = 0$

~~$1 \cdot 12$~~

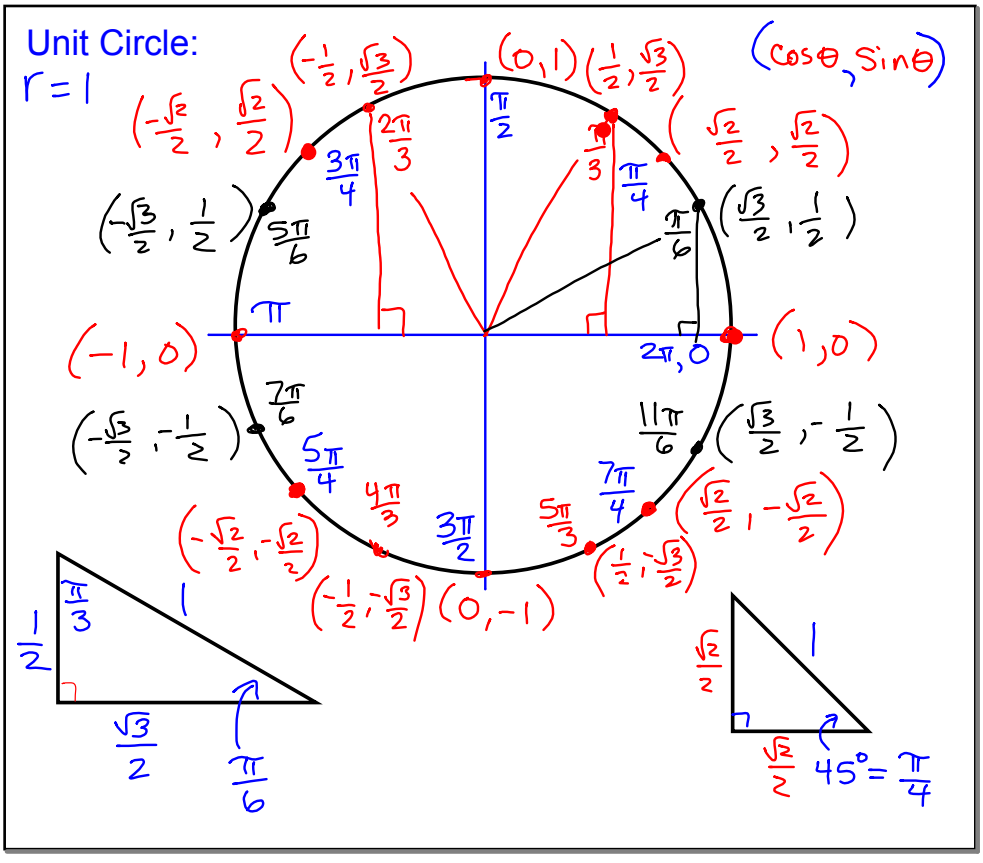
$2 \cdot 6$

$3 \cdot 4$

$3x + 4 = 0 \quad 2x - 3 = 0$

One more practice...

Build a Unit Circle




# CP's: 7- # 126 ---> 128

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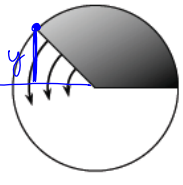
7-126. THE RADAR SCREEN



Brianna is an air traffic controller. Every day she watches the radar line (like a radius of a circle) go around her screen time after time. On one particularly slow travel day, Brianna noticed that it takes 2 seconds for the radar line to travel through an angle of $\frac{\pi}{6}$ radians. She decided to make a graph in which the *input* is time and the *output* is the distance from the outward end of the radar line to the horizontal axis.

x-axis is time in seconds

**Your Task:** Following the input and output specifications above, make a table and graph for Brianna's radar.

| Secs x | θ | y = sin θ |
|---|---|---|
| 0 | 0 | 0 |
| 2 | π/6 | 0.5 |
| 4 | | |
| 6 | | |
| ⋮ | | |
| v | | |

## Discussion Points

How can we calculate the outputs?

How is this graph different from other similar graphs we have made?

How long does it take to complete one full cycle on the radar screen?
How can we see that on the graph?

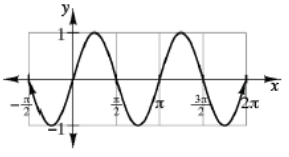
7-127. Now that you have seen that it is possible to have a sine graph with a cycle length other than $2\pi$, work with your team to make conjectures about how you could change your general equation to allow for this new transformation.

a. In the general equation $y = a\sin(x-h)+k$, the quantities $a$, $h$, and $k$ are called **parameters**. Where could a new parameter fit into the equation?

b. Use your graphing calculator to test the result of putting this new parameter into your general equation. Once you have found the place for the new parameter, investigate how it works. What happens when it gets larger? What happens when it gets smaller?

c. Write a general equation for a sine function that includes the new parameter you discovered.

7-128. Another word for cycle length is **period**. Which of the following have a period of $2\pi$? Which do not? How can you tell? If the period is not $2\pi$, what is it?

a. 


b. A pendulum takes 3 seconds to complete one cycle.

c. $y = \sin\theta$

d. A radar line takes 1 second to travel through 1 radian.

Week 9 Classwork

Warm Up

CP's 7 - # 113, 115

Salmon WS Sine graphs

CP's 7 - # 126 ---> 128

HW: 7-

#129 ---> 137

Short Quiz tomorrow: Build a Unit Circle